On the 28th moderate northeasterly gales were reported from a limited area in the vicinity of Hatteras, and on the 29th westerly winds of gale force were encountered by vessels near latitude 47°, longitude 33°. On both of these dates, with the exceptions stated, moderate weather prevailed. The conditions were similar on the 30th and 31st except for a small area between the 15th meridian and the French coast where a few vessels reported northwesterly gales. The storm log from the Danish S. S. *Pennsylvania* follows:

Gale began on the 30th. Lowest barometer 29.42 inches at 4 p. m. on the 30th; position, latitude 46° 25′ N., longitude 13° 30′ W. End of gale on the 31st. Highest force of wind 9; shifts WNW.-NW.

551.506 (265.2)

NORTH PACIFIC OCEAN.

By F. G. TINGLEY.

The abnormally low pressure which prevailed at Midway Island during the last decade of December gave way to high pressure at the beginning of January and this continued throughout the month. During the middle decade readings above 30.40 inches were recorded on several days. A similar change in pressure occurred at Dutch Harbor. At Honolulu pressure was somewhat above normal during the first half of the month and slightly below, on an average, during the latter half.

As would be inferred from the general change in pressure distribution the weather of the month was not so persistently stormy as was that of December, especially along the northern steamer route, although gales prevailed there on several occasions. On the other hand, unusual northeast gales occurred in the lower latitudes, especially during the period of highest pressure at Midway Island, or from the 10th to 17th, inclusive.

The opening days of the month brought an abatement of the severe gales which had swept the western part of the North Pacific during the last decade of December, reference to which was made in the review of the weather for that month. Relative quiet then prevailed until about the 8th, when reports indicate the renewal of storm conditions. Thereafter for several days vessels on the northern steamer routes experienced moderate to strong gales. During the 8th and 9th these occurred over the eastern portion of the ocean and were occasioned by a depression over southwestern Alaska. During the same dates and continuing until the 12th they were due to a series of depressions which advanced over Japan and the Kurile Islands. Following is the storm log of the Japanese S. S. *Sumatra Maru*, Capt. J. Nishida, Yokohama (January 5) for San Francisco, covering the 11th and 12th:

Gale began on the 11th; lowest barometer, 29.47 inches at 8 a. m. of the 12th in latitude 43° 59′ N., longitude 161° 17′ E.; highest force of wind, 11, from SSE.; shifts of wind, SSE.-S.-SW.-WSW.

According to Observer K. Tsujimura, the *Sumatra Maru* also had heavy weather on the 8th and 9th, 15th and 16th, and 24th.

The northeast gales in the lower latitudes which accompanied the high pressure in mid-ocean, already referred to, were experienced by several vessels which furnish meteorological reports to the Weather Bureau. A special report has also been furnished by Capt. Albert Wilson of the American S. S. *West Neris*, as follows:

The S. S. *West Neris*, en route on the circle from Van Diemen Strait to Honolulu, encountered in latitude 25° 45′ N., latitude 179° 30′ W., a violent gale with heavy squalls and a big sea, beginning from NE., true, at 10 p. m. January 12, shifting to ENE. the following day and ending at E. on January 17, 2 a. m. (five consecutive days) in latitude 22° 20′ N., longitude 169° 30′ W.

The *West Neris* during the above-mentioned dates was driven 110 miles south of her position on the circle, being unable to bear up to her course, the vessel being light.

The barometer on the *West Neris* for the five days commencing with the 12th read as follows: 30.32, 30.36, 30.38, 30.32, 30.24 inches, at Greenwich mean noon.

The American S. S. *Columbia*, Capt. Thomas Blair, Yokohama for Honolulu, had a similar experience. Mr. Elb, the observer, states that the northeast gale which began on the 12th in longitude 177° 30′ E. was still raging when the vessel came under the lee of the Hawaiian Islands on the 18th.

The American S. S. *West Hika*, Capt. H. Paulsen, Manila for Honolulu, also encountered these gales. Mr. H. C. Olsen, third officer and observer, states that they were caused by exceptionally strong trades.

These northeast gales were not confined to midocean. During the period from the 19th to the 26th the Norwegian M. S. *Theodore Roosevelt*, Capt. Eric Thomle, Caleta Buena (Chili) for Honolulu, had continuous fresh to strong NE. gales when between latitude 8° N., longitude 128° W. and latitude 20° N., longitude 153° W. During the whole time the barometer was very steady at about 30.16 inches.

On the 15th and 16th the Dutch S. S. *Eibergen*, Capt. W. H. de Forge, Portland (Oreg.) for Panama, at about latitude 14° N., 96° W., experienced a northeast storm, force 11, with high to phenomenal sea.

It is interesting to note that just previous to the commencement of these northeast gales in the North Pacific there had been a period of strong westerly winds in portions of the South Pacific, as reported by the Dutch S. S. *Rotti*, Capt. J. P. Scholtes, Macassar for Newcastle (N. S. W.). Mr. Cj. Mulder, observer on the *Rotti*, states that from January 4, when in latitude 9° 24′ S., longitude 132° 14′ E., until entering Torres Strait, on the 9th, a very strong SW. monsoon was experienced, the force varying generally from 5 to 7 and reaching 8 during squalls.

On the 28th and 29th several vessels off the northwest coast of the United States were involved in the disturbance, which, on the 29th, occasioned the record-breaking winds on the mainland. A velocity of 132 miles an hour was recorded at the North Head (Wash.) station before the instruments were carried away. The extreme velocity was estimated by the observer at 150 miles an hour.

The American M. S. *Sierra*, Capt. Olaf A. Janson, Bellingham for Callao, was proceeding down the coast at the time and felt the full force of the gale. Observer John Behrsin has furnished the following report:

At 9 a. m. on the 29th the wind, which previously had died down to force 3, increased to force 5, SSE.; by noon it had increased to force 12 and changed to S. and a little later to WSW., when it started to lose its force. A high and choppy sea was running and the vessel was rolling, pitching, and shipping heavy seas. For a while it seemed that we would lose our deck load of lumber and this would have happened had the wind not moderated when it did. When the wind was at its highest force, between 11 a. m. and 12 noon, the water of the sea was driven in the air in sheets just like heavy rain driven by a strong wind. It was not raining at the time although it was cloudy.

The barometer on board the *Sierra* read as follows: 9 a. m., 29.52 inches; 10:20 a. m., 29.45 inches; 12:55 p. m., 29.22 inches; 3 p. m., 29.50 inches; 8 p. m., 29.70 inches; midnight, 29.75 inches.

At North Head, 150 miles north of the position of the *Sierra*, the barograph trace shows a sharp fall in pressure to a minimum of 28.90 inches shortly after 3:30 p. m., followed by an equally rapid rise. At Tatoosh Island, 150 miles north of North Head, a similar fluctuation of pressure occurred, a minimum of 28.78 inches being recorded at 7 p. m. The observed conditions point to the northward movement of a small secondary depression, of imperfect formation, at a speed of about 50 miles an hour.